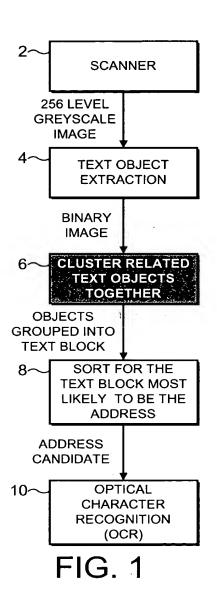
Title: IMAGE PROCESSING FOR CLUSTERING RELATED TEXT OBJECTS Inventor(s): Robert Edward Meredith SWANN, et al.

Serial No.: 09/724 182

Docket No.: R&G C-314

Replacement Sheet

1/5

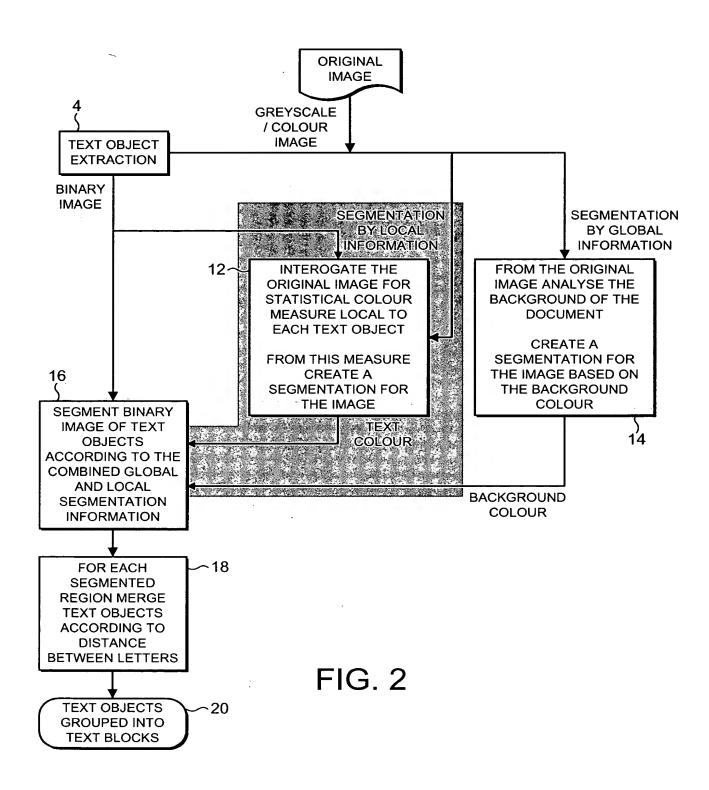


Fitle: IMAGE PROCESSING FOR CLUSTERING RELATED TEXT OBJECTS Inventor(s): Robert Edward Meredith SWANN, et al.

Serial No.: 09/724 182 Docket No.: R&G C-314

Replacement Sheet

2/5



Title: IMAGE PROCESSING FOR CLUSTERING RELATED TEXT OBJECTS Robert Edward Meredith SWANN, et al. Inventor(s):

Serial No.: 09/724 182 Docket No.: R&G C-314

Replacement Sheet

ST AVAILABLE COPY

A) ORIGINAL **DOCUMENT IMAGE**

FEB 0 7 2005



50 150 250 300 300

FIG. 3A

D) EXTRACT **BACKGROUND** FROM ORIGINAL

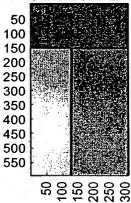


FIG. 3D

B) EXTRACTED BINARY **TEXT OBJECTS**

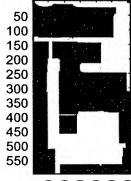
3/5



50 150 250 250 300

FIG. 3B

C) CLUSTERING USING SIMPLE MERGING. **ALL TEXT OBJECTS** ARE CLUSTERED **TOGETHER**



50 150 250 250 360 360

FIG. 3C

E) SEGMENT ACCORDING TO BACKGROUND. FOR EACH BACKGROUND REGION SEPARATELY APPLY MERGING TO THE TEXT OBJECTS

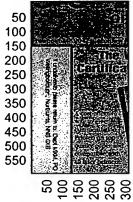




FIG. 3E

F) THE RESULTS ARE CLUSTERED TEXT **OBJECTS THAT HAVE** CONSISTENT **BACKGROUND**

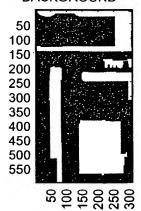


FIG. 3F

Title: IMAGE PROCESSING FOR CLUSTERING RELATED TEXT OBJECTS Inventor(s): Robert Edward Meredith SWANN, et al.

Serial No.: 09/724 182 Docket No.: R&G C-314

Replacement Sheet

4/5

BEST AVAILABLE COPY

ORIGINAL DOCUMENT IMAGE

Flat 1156 550 LETTUCE 600 TROUBLE 650 My wife and I like Thumb' lettuces, by 700 trouble growing the 750 them off in pots in I greenhouse; but Wh 800 them out after the fi gone, they collapse 850 over. How can lipre

> from happening agal S A Barton, Essex

Twould have a go

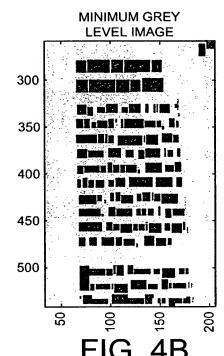
FIG. 4A

FIG. 4C

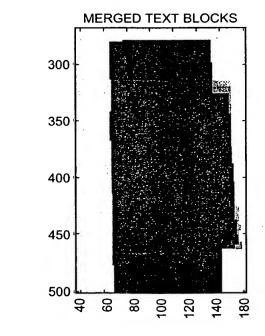
900

950

1000 1050 FOR EACH OF THE BINARY TEXT OBJECTS
EXTRACTED THE LOCAL MINIMUM GREYLEVEL
IS OBTAINED FROM THE ORIGINAL IMAGE.
THE LOCAL MINIMUM GREYLEVEL IS A
MEASURE OF THE TEXT COLOUR



THE MINIMUM GREYLEVEL DATA IS USED TO BUILD A SEGMENTATION OF THE IMAGE. EACH REGION IN SEGMENTATION IS AN AREA OF THE IMAGE WHERE THE TEXT COLOUR IS CONSISTENT.



Title: IMAGE PROCESSING FOR CLUSTERING RELATED TEXT OBJECTS Inventor(s): Robert Edward Meredith SWANN, et al. Serial No.: 09/724 182 Docket No.: R&G C-314 Replacement Sheet 5/5 **ORIGINAL IMAGE** 256 LEVEL **GREYSCALE IMAGE** TEXT OBJECT **EXTRACTION BINARY IMAGE** SEGMENTATION BY LOCAL BY GLOBAL INFORMATION **INFORMATION** 12-INTEROGATE THE FROM THE ORIGINAL ORIGINAL IMAGE FOR **IMAGE ANALYSE THE** STATISTICAL COLOUR **BACKGROUND OF THE** MEASURE LOCAL TO **DOCUMENT EACH TEXT OBJECT CREATE A** FROM THIS MEASURE SEGMENTATION FOR CREATE A THE IMAGE BASED ON 16 SEGMENTATION FOR THE BACKGROUND THE IMAGE **COLOUR** SEGMENT BINARY **IMAGE OF TEXT** 14 **OBJECTS** ACCORDING TO THE COMBINED GLOBAL AND LOCAL **BACKGROUND SEGMENTATION GREYLEVEL INFORMATION** FOR EACH **-18 SEGMENTED REGION MERGE TEXT OBJECTS ACCORDING TO** DISTANCE BETWEEN LETTERS **OBJECTS GROUPED INTO TEXT BLOCKS** SORT FOR THE **TEXT BLOCK MOST** LIKELY TO BE THE **ADDRESS** FIG. 5 **ADDRESS** CANDIDATE **OPTICAL** -10 CHARACTER BEST AVAILABLE COPY RECOGNITION (OCR)